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CLAIMS

1. A method for locating and beaconing any chosen touchdown surface or area (H) for an intervention at night or in bad weather of at least one airborne and in particular heliborne team carrying out in particular one or more rescue operations, cooperating with at least one person intervening on the ground (x) positional on said chosen touchdown surface or area (H), so as to allow the fast and safe landing and/or takeoff of all types of aircraft and in particular of helicopters, transporting airborne and in particular heliborne team or teams, characterized in that it allows said airborne and in particular heliborne team, after deployment, setup and lighting of an item of hardware by said at least one person intervening on the ground (x), to pinpoint, locate, approach and overfly any chosen touchdown surface or area (H), by visual location and beaconing formed of at least five independent and energy-autonomous beacons, so as to cause a visible luminous change from the aircraft with the aid of the beaconing which emits skyward a substantial horizontal central beam (α) of light vertically concentrated (β) as well as a light of different color, only the central beam being perceived by the passage of the aircraft vertically above this beaconing, so as to land and/or to take off again in complete reliability on the touchdown area.

2. The method of intervention as claimed in claim 1, in which said at least one person intervening on the ground (x), after having chosen said touchdown surface or area with a view to the intervention and charted its precise geographical coordinates by virtue of a GPS receiver (41) makes contact by any means of

communication in particular radio or telephone with said airborne and in particular heliborne team or teams, so as to immediately transmit the precise geographical coordinates of said chosen touchdown surface or area (H) to be located and to be beacons with a view to ensuring their intervention, at night or in bad weather, thereon so as to allow said intervention within the shortest timescales.

3. The method as claimed in claim 2, in which said at least one person intervening on the ground (x) ensures the easy carriage of the hardware on said chosen touchdown surface or area (H) in such a way as to set up, on the latter, a first so-called visual locating unit (A) and a second so-called beaconing unit (B) for the purposes of ensuring visual locating of said chosen touchdown surface or area (H) thus allowing a safe approach and a reliable landing of all types of aircraft and in particular of helicopters, transporting said airborne and in particular heliborne team or teams.

4. The method as claimed in any one of the preceding claims, in which the pilot of an aircraft and in particular of a helicopter, transporting said airborne and in particular heliborne team or teams, arriving vertically above the chosen touchdown surface or area (H) perceives a change of the color generated by the beaconing unit disposed in a Y (16a to 16e), from white to blue, thus confirming to him that his aircraft and in particular his helicopter is indeed above said chosen touchdown surface or area (H) and also confirming to him, during his vertical passage, the axis and the direction of approach of safety, said axes and direction of approach of safety having previously

been defined by said at least one person intervening on the ground (x) after the latter has assured himself of the absence of surrounding obstacles and has taken account of the wind information for the chosen touchdown surface or area (H).

5. An intervention device for the implementation of the method as claimed in any one of the preceding claims, characterized in that it comprises two leaktight housings (1, 2), that can be easily carried by said at least one person intervening on the ground (x) and are intended to be disposed on said chosen touchdown surface or area (H), the interior volume of said housings (1, 2) being intended to accommodate, retain and allow the extraction with complete reliability of the hardware constituting said device necessary for said intervention with a view to its fast and effective mounting, said hardware consisting of two units disposed respectively in each of said housings (1, 2), namely:

- a first so-called visual locating unit (A), for said chosen touchdown surface or area (H) comprising at least one lamp with successive white flashes (7), linked to a high frequency current generator box (8), said first unit being, after setup, visible in flight from a distance of greater than forty kilometers by the pilot of the aircraft and in particular of the helicopter transporting said airborne and in particular heliborne intervention team or teams,

- a second so-called beaconing unit (B), for said chosen touchdown surface or area (H) for said airborne and in particular heliborne team or teams, comprising at least five independent luminous beacons (16a to 16e) that are autonomous in terms of electrical energy and are furnished with a set of optical cones (25)

possessing a central orifice (27) for emitting a light oriented about the vertical axis of each beacon and faces (26) for emitting a light departing from the horizontal plane and at the angle (α) formed by these faces (26), and which are intended to generate at least five luminous points fixed on the ground after their setup, and elements of a kit (42, 43, 44, 45 and 46) allowing instantaneous mounting of a complete windsock (17) and of its autonomous lighting system (47), said second unit ensuring, after setup, a beaconing of said chosen touchdown surface or area (H), compatible with any difficult vision system and in particular night vision goggles.

6. The intervention device as claimed in the preceding claim, in which said at least one person intervening on the ground (x) ensures the visual locating of said chosen touchdown surface or area (H) with the aid of the hardware and in particular by instantaneously fixing a lamp with successive white flashes (7) of very high power with the aid of a mechanical sucker (14) onto any appropriate support and in particular onto the cover (1a) of said first housing (1) of the device in accordance with the invention from which he has just extracted it, and by illuminating with the aid of an on/off button (36) supplied via the module of lithium electric batteries (9) linked to the high frequency current generator box (8) in such a way as to allow the aircraft pilot and in particular helicopter pilot, transporting said airborne and in particular heliborne team or teams, to visually locate, in flight, the intervention site from a distance of greater than forty kilometers at night.

7. The intervention device as claimed in the

preceding claim, in which said at least one person intervening on the ground (x) ensures the beaconing of said chosen touchdown surface or area (H) by disposing at least five independent, rainproof and dustproof beacons (16a to 16e) that are autonomous in terms of electrical energy, in such a way as to generate at least five fixed luminous points drawing a Y on the ground, said beacons (16a to 16e) generating a light termed "cold light" in such a way as to be able to be used by the pilot of an aircraft approaching, and in particular a helicopter, transporting said airborne and in particular heliborne team or teams, either with the naked eye, or with night vision goggles, or under infrared for military applications.

8. The intervention device as claimed in the preceding claim, in which said at least one person intervening on the ground (x) modifies, by simple presses exerted either on the control button (35) of a remote control (34) provided for this purpose, or on the manual control button (37) situated on the body of each of the beacons, the lighting power levels of said beacons (16a to 16e) as a function of the night vision equipment of the pilot of an aircraft approaching, and in particular a helicopter, transporting said airborne and in particular heliborne team or teams, and/or as a function of the various night levels encountered during the approach.

9. The intervention device as claimed in any one of claims 5 to 8, in which said at least one person intervening on the ground (x) ensures the transmission to the pilot of the aircraft and in particular of the helicopter, transporting the airborne and in particular heliborne team or teams, of the information pertaining

to the wind by very rapidly mounting the cylindrical sections or tubes (44, 45) of the collapsible mast (43), surmounted by a windsock (17) supporting at its center, by any appropriate means, an autonomous lighting system (47), the fixing of said mast (43) being obtained with the aid of a stainless steel spike (42) driven into the ground or with the aid of a sucker (46) applied to any appropriate support.

10. The intervention device as claimed in claim 5, in which said leaktight housings (1, 2) take the form of housings or briefcases made of polypropylene copolymer resin and are equipped with snap-fit fast open and close devices (18, 19) and with depressurization valves (3a, 3b).

11. The intervention device as claimed in the preceding claim, in which the weight of the first housing (1) does not exceed ten kilograms and its bulk is reduced so as to be able to be transported with the aid of a carrying handle (6a) by a single person.

12. The intervention device as claimed in the preceding claim, in which the interior of said first housing (1) is clad with a cellular padding (4a) made of plastazote or any other appropriate material exhibiting a bottom (1b) in which are fashioned compartmentalization cells, hereinafter dubbed cells or pockets, making it possible to accommodate, to retain in a reliable manner and to rapidly withdraw the hardware constituting said first visual locating unit (A).

13. The intervention device as claimed in claim 5, in which said first visual locating unit (A), accommodated

in said first housing (1), consists of a module of lithium electric batteries (9) of thirty-five amperes, of a high frequency current generator box (8), of a light with four successive white flashes (7) forming the flash lamp, of a system for turning on and off by remote control, of the manual on/off control button (36), of wiring and of couplings for fast electrical connection (10, 11) linking these various elements together.

14. The intervention device as claimed in the preceding claim, in which the light with four successive white flashes (7) is a light with four successive white flashes of very high power, mounted on a mechanical sucker (14), or on any other appropriate support, allowing its instantaneous fitting to the top of the first housing (1) reclosed after the removal of said light.

15. The device as claimed in claim 13 or 14, in which the light with four successive white flashes (7) is supplied either by the module of lithium electric batteries (9) allowing its continuous use for more than twelve hours, or by a cigar lighter socket of a ground vehicle providing electrical current of a voltage of twelve volts or of twenty-four volts, or by a second module of lithium electric batteries, identical to the first module, (not represented) designed for supplying backup energy to the high frequency current generator box (8).

16. The intervention device as claimed in claim 5, in which said second unit (2), the so-called beaconing unit (B) accommodated in said second leaktight housing (2), does not exceed a weight of twenty kilograms and

its bulk is such that it can be carried in one hand by a single person, said second housing (2) being furnished like the first housing (1) with a snap-fit fast open and close device (18, 19) and with a depressurization valve (3b).

17. The intervention device as claimed in the preceding claim, characterized in that said second housing (2) comprises a bottom (2b) clad with a cellular padding with two stages (4b, 4c) made of plastazote in which are fashioned compartmentalization cells, making it possible to accommodate, to retain in a reliable manner and to rapidly extract the hardware constituting the second so-called beaconing unit (B) for said chosen touchdown surface or area (H) for the intervention of said airborne and in particular heliborne team or teams.

18. The device as claimed in any one of the preceding claims, characterized in that the body of said beacons (16a to 16e) encloses a box of ten electric batteries (31) of standard AA or LR6 type, the shape of said body, in the lower conical part, is devised so as to return a part of the light downward in order to create a halo of light on the ground giving the pilot a horizontal plane effect and the height of said body is such that it makes it possible to fashion a lighting zone situated above the foliage or other natural obstacles on the ground.

19. The intervention device as claimed in claim 8, characterized in that it comprises a receiver box (33) for the radio transmissions of the remote control (34), inserted inside the body (20) of said beacons (16a, 16e) so as to allow said at least one person

intervening on the ground (x) to remotely turn on or turn off said beacons (16a to 16e) and to modify the lighting intensity thereof, without moving and without entering the safety zone of ground deployment of the aircraft and in particular of the helicopter, with the aid of a remote control (34) contained in said second housing (2), said receiver box (33) being able also to be controlled directly by the pilot of the guided aircraft and in particular of the helicopter, transporting said airborne and in particular heliborne team or teams, by virtue of the radio thereof.

20. The intervention device as claimed in any one of claims 5 to 19, characterized in that the lighting generated by said beacons (16a to 16e) is a light termed "cold light" obtained with the aid of LED diodes (22, 23, 24) generating a light of high intensity while benefiting from extremely reduced consumption thus making it possible to ensure a lighting of more than twelve hours at full power, the electronic circuit supporting the LED diodes (22, 23, 24) being designed in such a way as to be able to use the beacons (16a to 16e) either with the naked eye, or with night vision goggles, or under infrared for military applications.

21. The intervention device as claimed in the preceding claim, in which the light emitted by said beacons (16a to 16e) is emitted at an angle lying between zero degrees on a horizontal plane and plus thirty-five degrees in the vertical plane, this representing the angle at which an aircraft, and in particular a helicopter, arrives from far away, a set of optical cones (25) concentrating a ray of blue light upward at an angle of thirty-five degrees about the vertical axis of said beacons (16a to 16e), thus

allowing a pilot of an aircraft and in particular a helicopter, transporting said airborne and in particular heliborne team or teams, to approach the Y consisting of five white points which become blue when his aircraft and in particular his helicopter passes vertically above said Y, this change of color from white to blue confirming to said pilot of the aircraft and in particular of the helicopter that he is indeed above said chosen touchdown surface or area (H) which has been prepared for him by said at least one person intervening on the ground (x).

22. The intervention device as claimed in claim 8, characterized in that the change of the various levels of power is obtained either by simple presses exerted on the button (35) of the remote control (34) provided for this purpose, or by the radio of the aircraft and in particular of the helicopter, or by manually actuating the control button (37) situated on the body of each beacon.

23. The intervention device as claimed in claim 5, characterized in that said second unit (2) also comprises in the form of a kit, contained in said second housing (2), the windsock (17) furnished with an autonomous lighting system (47) and a collapsible mast (43) allowing its fast setup so as to give the pilot of the aircraft and in particular of the helicopter transporting said airborne and in particular heliborne team or teams, the wind information item or items regarding said chosen touchdown surface or area (H).

24. The intervention device as claimed in the preceding claim, characterized in that said mast (43) consists of cylindrical sections or tubes made of

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carbon fiber (44, 45) that can be very rapidly collapsed, that is resistant to blast without any risk of being blown away and pitching, after mounting, said windsock (17) more than 4 meters above the ground.

25. The intervention device as claimed in claim 23 or 24, in which said mast (43) is fixed with the aid of a stainless steel spike (42) engaged in said cylindrical section or lower tube (45) of the mast (43) and being driven into the ground.

26. The intervention device as claimed in any one of claims 23 to 25, in which said mast (43) is fixed on any appropriate support with the aid of a sucker (46) controlled by a mechanical lever.

27. The intervention device as claimed in any one of claims 23 to 26, in which said windsock (17) is illuminated in an autonomous manner with the aid of a leaktight autonomous lamp (47), fixed at its center by a support (48) or by any appropriate means, and consisting of a group of LED lamps ensuring it autonomous lighting of more than twelve hours of white light termed "cold light".